Adoption of mobile devices by academic staff: the reality

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Before mobile technology can be introduced into a teaching and learning situation, it would be expected that the confidence and ability of the teachers' to understand and use the technology would be a significant factor for successful integration. The research presented in this paper is part of a multi-institute research project to implement a framework using mobile devices for enhanced learning and institutional change across different disciplines and institutions. The paper focuses on a survey to benchmark the use of mobile technology by academic staff in one of the tertiary institutes involved in the wider study. Findings identify that not all staff have equal access to these types of devices nor use these devices extensively to support their work. The reasons for this are wide but include cost, perceived ability and technical factors.

Keywords: mobile devices, academic staff, adoption

Introduction

The push to introduce mobile technology into the educational arena has placed a strong focus on students' usage and adoption. However, an important factor to be considered, is the adoption of mobile technology by academic staff. Academic staff, and especially teaching staff, are largely the gatekeepers to the introduction of new technology in the classroom. Students are able to utilise new technology in an informal sense, however it will often be at the discretion of the teacher for its inclusion into formal education. Therefore, it will be up to teachers to introduce and include activities that can be supported by mobile technology.

A recent study of tertiary teaching staff has shown that their uptake of mobile technology is significantly lower than their students (Mac Callum, Jeffrey & Kinshuk, 2014). The research found that teachers often do not have access to mobile devices and are largely ill informed as to how these technologies can be effectively integrated into their teaching practice.

The successful introduction of any mobile learning initiative needs to first consider the teacher. Adoption theory highlights the need for teaching staff to first be comfortable with a new technology, before it can be effectively integrated into teaching practice (Ertmer, 2005). For teachers to become comfortable with mobile technology, they must first have access to the technology. They then need to be comfortable with the technology on personal level, before introducing it into their teaching practice.

This paper will discuss the findings of recent survey addressing the current usage of academic staff access at a tertiary institute. The study aims to benchmark the current usage of mobile technology by academic staff and indicate the initial issues surrounding the integration of mobile technology to support teaching practice.

Learners and mobile devices: A framework for enhanced learning and institutional change - the wider research project

At the beginning of 2014, a national project was launched in conjunction with six tertiary institutions. The project's goal is to implement a framework using mobile devices for enhanced learning and institutional change across different disciplines and institutions. The primary aim is to generate practical strategies for students and teachers to use the affordances of mobile devices for more effective learning, and provide guidelines for pedagogical and institutional transformation. (Ako Aotearoa, 2014).

The outcome of this wider study will be to develop case studies that showcase effective integration of mobile technology. These case studies will investigate the effective integration within various tertiary contexts from the six institutions. Within each institution a group of lecturers will be exploring, designing, and integrating mobile devices into their own curriculum as appropriate for the needs of their learners. The project's aim is to help build a platform for future uptake of mobile technology within each institution and within the wider educational context.

Current adoption and perceptions of academic staff

Before teachers are able to start using mobile technology, to support teaching and learning, it should first be established what is the current uptake and barriers to their adoption. A survey was initiated to benchmark the current usage and opinions of academic staff towards the use of mobile technology to support academic activities. The survey's aim was to start drawing out the initial issues that will need to be overcome and benchmark where the institution currently sits within the adoption of mobile technology. Therefore the study determined two things:

1. What is the current uptake of mobile technology by academic staff? Specifically what devices do academic staff have and how are they using these devices to support their work.
2. How do academic staff perceive mobile technology? Specifically, what do they think will inhibit their adoption of mobile technology?

The survey

A short exploratory survey was undertaken at one of the institutions involved in the project, with a focus on academic staff - both teaching and non-teaching, and management. It was decided to survey these three groups as they all have the potential to influence the successful adoption of mobile learning.

The study surveyed 307 academic staff with a response rate of 23% (n=70 responses). The participants represented a convenience sample of academic staff within the one tertiary institution in New Zealand. They were invited to participate in the survey via an email invitation, with a link to an online survey. From the sample there were slightly more females (59%, n=41), with the large majority being teaching staff (77%, n=54). A smaller number were from management (14%, n=2) and non-academic (6%, n=3). Most of the respondents had been employed at a tertiary institution for over 10 years (66%, n=46) and were 50-59 of age (34%, n=24). A slightly smaller number of respondents fell within the 40-49 age group (23%, n=16) and the 60 plus age group (23%, n=16).

Results and discussion

The results indicated that respondents on average felt they were either confident (can manage files, use the internet and a variety of applications) (37%, n=26) or proficient (am happy to provide assistance to others) (47%, n=33) with computers. Conversely, the respondents were not as confident with their mobile devices. With a wide range of respondents either okay (happy to work on a mobile device) (21%, n=15), confident (30%, n=21) or proficient (29%, n=20) with mobile devices.

General work-related activities

The first part of the survey, asked the respondent to indicate the types of mobile devices that they had access to for work purposes. The results indicated that a higher than expected percentage of respondents did not have a mobile device (smartphone and tablets) or did not use it for work (21%, n=15). Of these devices, held by the respondents, the majority were iPhones (n=23) and iPads (n=38). In addition, most of these devices were owned by the respondent, rather than provided to them by the institution.

The survey then asked the respondent to identify, based on a list of 17 common work activities, whether they undertook these activities on their mobile devices. These results, shown in Table 1, revealed how they using their respective devices for work purposes.

The results indicate that the respondents, as a whole, were generally more likely to be consumers of content, rather than producers. Proponents of mobile learning have largely offered the notion that mobile technology enables the user to no longer be merely consumers of content but producers and creators (Bruns, Cobcroft, Smith, & Towers, 2007). These results hint towards the true extent of mobile learning adoption, it indicates that educators themselves are not necessarily ready to use mobile technology to be producers of content. This behavior may further be reinforce the behavior of their students', whereby students may not be encouraged to be producers of their own learning.

Other uses by the respondents further reinforced this consumer approach. When asked what other uses respondents have with their devices; fifteen respondents stated that they also use their mobile devices for calling or texting students; five respondents used them for recording meetings and taking notes; two for taking

attendance and marking students work; one for authoring ebooks for course, and attending seminars.

Table 1: Work related activities undertaken using a mobile device (n=70)

	Both Tablet & Smartphone % (n)	Tablet only % (n)	Smartphone only% (n)	Neither % (n)	One sample t-test between tablet and smartphones (%)
Taking photos	30% (21)	10% (7)	30% (21)	30% (21)	2.789 (.007)
Viewing and replying to Email	29% (20)	21% (15)	19% (13)	31% (22)	0.265 (.792)
Searching the Internet	31% (22)	17% (12)	17% (12)	34% (24)	0
Using the calendar tool	33% (23)	14% (10)	14% (10)	39% (27)	0
Researching	23% (16)	23% (16)	10% (7)	44% (31)	1.944 (.056)
Facebook	27% (19)	11% (8)	16% (11)	46% (32)	0.809 (.421)
Reading ebooks, documents or articles	24% (17)	20% (14)	9% (6)	47% (33)	1.746 (.085)
Sourcing and viewing videos	24% (17)	16% (11)	9% (6)	51% (36)	1.183 (.241)
Cloud storage (such as Google Drive, Dropbox etc.)	21% (15)	16% (11)	4% (3)	59% (41)	2.330 (.023)
Accessing institute systems (e.g. financial, timetables, results)	14% (10)	19% (13)	4% (3)	61% (43)	2.755 (.008)
Video chat (such as Skype or Google Hangouts)	16% (11)	14% (10)	4% (3)	66% (46)	2.029 (.046)
Recording voice	19% (13)	3% (2)	9% (6)	66% (46)	1.471 (.146)
Using your Learning Management System (LMS)	14% (10)	16% (11)	0% (0)	70% (49)	3.651 (.000)
Productivity tools (word processing/spreadsheet/ presentation)	7% (5)	19% (13)	4% (3)	70% (49)	2.755 (.008)
Twitter	19% (13)	1% (1)	7% (5)	73% (51)	1.816 (.074)
Creating videos	7% (5)	4% (3)	9% (6)	76% (53)	1.172 (.245)
Writing a blog	9% (6)	7% (5)	1% (1)	83% (58)	1.816 (.074)

The results also reinforced the belief that different devices afford different activities. A one-sample t-test between proportions was performed to determine whether there was a significant difference between the percentage of respondents using a tablet over a smartphone ($p < .05$), The results indicated that respondents were more likely to take photos on their smartphones ($t(69)=2.789$). Unsurprisingly tablets were more likely used for accessing Learning Management System (LMS) ($t(69)=3.651$), using productivity tools ($t(69)=2.755$), accessing the institution's systems (($t(69)=2.755$), and using cloud storage ($t(69)=2.330$).

Mobile devices use to engage students

However, despite this general trend towards consumerism, the results show that on the margins some lecturers were using mobile devices to create content and were using these devices to engage their learners. Out of the 70 responses only 11 participants indicated they used their mobile devices directly with their students. Their uses fell within three broad areas, encouraging students' interaction, capturing knowledge and students' learning experiences and sharing resources.

Encouraging student's interaction in class
Examples of this ranged from lecturers getting students to research topics and brainstorm in class to using these devices to gain feedback in class. For example, one teacher stated that when she was doing group work with a large number of students, she would send the group leader a text or clip to use from her mobile phone, which was viewable on a mobile device. Mobile devices were also used to gather feedback and assess understanding using quizzes. For example, one lecturer described how she used Polleveryehere.com to create polls where students could vote using their mobile devices. Mobile applications were also used in class by some lectures. Applications such as cookery apps and apps that control nursing equipment were used in some classes. Another lecturer used more general applications, such as presentation, cloud storage and visual language applications with her students.

Capturing knowledge and students' learning experiences
Eight lecturers described how they were using their devices and their students' devices to take videos and photos of students work as evidence of achievement. One specific example given by a lecturer was where he would use his mobile device to take annotated videos/pictures of the assessment cookery dishes. Three lecturers were also using their mobile devices to record lectures or guest presentations and white board notes. These recordings were then shared online with their students.

Sharing resources inside and outside class
Mobile devices were used by a four lecturers, to shows presentations, access a remote desktop, view websites, images and You Tube clips from their devices in class. Mobile devices usage was also encouraged outside the classroom. One lecturer had created videos and podcasts that students could download to their mobile devices. Another lecturer was using mobile technology to encourage sharing and communication. The lecturer set up a blog where student were able to email/post links and comments via their mobile devices. This would then be curated on the blog and via RSS fed integrated into the class LMS and Wiki.

Inhibitors of future adoption

The last part of the survey asked participants what they felt would inhibit their future adoption of mobile technology for educational purposes. A wide range of issues were highlighted but three broad issues that were identified most often were cost, perceived ability and technical factors.

The first, related to supporting lecturers in obtaining the skills, developing the confidence needed to use and integrate mobile technology effectively into their teaching and supporting them with this integration (n=29). This view encapsulated by one lecturer that stated, "I think my phone could do a lot more if I knew how to use it" (*LA04*). Due to the relative newness of mobile technology, the effect that mobile learning will have on teaching is still being explored, and the pedagogy for effective use is also still being refined. Teachers need to be guided on effective use and supported in their upskilling. Some lectures stated that resources (such as time and support) were needed to enable teachers to explore and adapt learning material to lend itself towards mobile learning.

The second inhibitor, was the cost and access associated with owning and using the mobile devices (n=29). Other than the actual cost of the devices to purchase, a high number of lectures battled with the work versus personal nature of mobile devices. In particular, a number of responses indicated that if the devices were for work purposes, the use of or access to these devices should be supported by their employer. For example one respondent stated, "I paid for my own devices so they are not for work. If work expects me to be using them then they pay - all these things require money" (*LA54*). Further to this, even if the employer supplied them with the device there is often associated costs of use, for example applications purchases and data charges that limit the usage of the devices. This was expressed by one lecturer that stated, "Cost inhibits the use of my mobile device… I personally pay for the costs for the data and texts, this can sometimes limit how often I can use my device for work." (*LA37*).

The last issue related to technical hurdles with using the devices at work (n=21). The top technical issues highlighted were problems with Wi-Fi access and connection and integrating the devices with other work systems. Many of these hurdles were largely due to institutional policies or infrastructure limitations. Issues like unstable Wi-Fi connections, the need to login on multiple screens and repeatedly re-login, and incompatible policies that do not support specific tasks (such as sharing screens and connecting to the whiteboards) have actively limited the use by lecturers. In particular, these technology issues, were seen as a major stumbling block to any mobile learning initiatives already undertaken by some lecturers.

Conclusion

The results of this survey provided a good insight into how academic staff are using their mobile devices to support their work. From the results it is apparent that often due to the cost of these devices not all staff members have access to devices. Moreover, those that do have mobile devices are not necessarily using them extensively in their work and teaching. The major reasons for this seems to be that staff are not confident or feel that they lack the skills in using these devices and that technical factors are impacting negatively on its use. Overall, the study has highlighted the need to develop an encompassing strategy to address these issues before the wider role out of any mobile learning initiative.

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